

Amendments to the Claims:

Please amend claims 1, 5, 8, 10-12, 14, 17 and 18 and add claims 24-34. This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) In a pipette ~~having a nozzle to which a tip may be removably mounted,~~
a mechanism for facilitating the removal of the ~~a tip from the nozzle~~ including:

a spring loaded nozzle to which the tip may be removably mounted:

a spring loaded ejector sleeve through which said nozzle passes, said sleeve terminating near an end of the nozzle to which ~~a~~ the tip is mounted when the sleeve is in a normal position, the sleeve being moved away from said end of the nozzle against a spring load when the tip is mounted to said nozzle; and

said sleeve including a first latch portion which mates with a second latch portion of said pipette when said sleeve is in a retracted position to which said sleeve is moved when the tip is properly mounted to said nozzle to hold said sleeve in said retracted position against said spring load, and a third latch portion operable to unmate said first and second latch portions, freeing said sleeve to return in response to said spring load to the normal position, the sleeve engaging said tip before reaching said normal position to facilitate the removal of the tip.

2. (Previously Presented) The mechanism as claimed in claim 1 including an overforce mechanism operable to supplement said spring load in moving said sleeve to said normal position against a stuck tip to further facilitate removal of said tip.

3. (Previously Presented) The mechanism as claimed in claim 1 wherein said first latch portion is a keyhole slot formed in said sleeve, wherein said second latch portion is a detent having a large portion which fits in an enlarged portion of said slot when said sleeve is in the retracted position and a small portion sized to fit in a narrow portion of said slot, said narrow portion

being adjacent said detent except when the sleeve is in the retracted position, and wherein said third latch portion is a button operable for moving said small portion of the detent into said narrow portion of said slot, whereby said sleeve becomes unlatched.

4. (Previously Presented) The mechanism as claimed in claim 3 wherein said detent is spring biased to move the large portion of the detent into said enlarged portion of said slot.

5. (Currently Amended) The mechanism as claimed in claim 1 wherein said first latch portion is a projection at a proximal end of said sleeve, said second latch portion is a mating lip on a latch plate biased to have the lip engage the projection when the sleeve is in ~~its~~ the retracted position, and said third latch portion is a portion of said latch plate which is manually operable to move the plate against ~~its~~ the bias to move said lip away from said projection, permitting said sleeve to return to ~~its~~ the normal position.

6. (Previously Presented) The mechanism as claimed in claim 5 including an angled surface on said plate positioned to engage an angled surface associated with said sleeve when said latch plate is moved beyond a point where said lip no longer engages said projection to supplement said spring load in moving said sleeve to the normal position against a stuck tip to further facilitate removal of said tip.

7. (Previously Presented) The mechanism as claimed in claim 1 including a mechanism for controlling the force with which the tip is mounted to said nozzle.

8. (Currently Amended) The mechanism as claimed in claim 7 wherein said mechanism for controlling ~~includes mounting~~ is operable for moving said nozzle ~~to be movable~~ away from a tip mounting force and against a bias spring.

9. (Previously Presented) The mechanism as claimed in claim 8 wherein said bias spring has less load than the spring load applied to said ejector sleeve.

10. (Currently Amended) The mechanism as claimed in claim 1 wherein said ejector sleeve is operable for being moved away from said end of the nozzle by said tip.

11. (Currently Amended) The mechanism as claimed in claim 1 wherein said ejector sleeve is operable for removing said tip is when mounted in a rack of a plurality of tips having a protrusion adjacent each tip, ~~and wherein~~ by said ejector sleeve is being moved away from said end of the nozzle by the protrusion adjacent the tip being mounted.

12. (Currently Amended) The mechanism as claimed in claim 1 wherein ~~the mating of said first and second latch portions results in~~ are operable for mating and are operable for generating an operator perceptible feedback output when mating.

13. (Previously Presented) The mechanism as claimed in claim 12 wherein said operator perceptible feedback output is at least one of an audible output and a tactile output.

14. (Currently Amended) A mechanism for facilitating the removal of a pipette tip ~~from a pipette nozzle~~ including:

a nozzle operable for moving as said tip is mounted to said nozzle;

an ejector normally biased to a first position near an end of said nozzle to which said tip is mounted, and movable as said tip is mounted to said nozzle against the bias, the ejector reaching a retracted position when the tip is fully mounted; and

a latch for maintaining the ejector in said retracted position, said latch including a selectively operable latch release, the bias returning said ejector to said first position when said latch release is operated to facilitate ejection of the tip mounted to the nozzle.

15. (Previously Presented) The mechanism as claimed in claim 14 including an overforce mechanism operable to supplement said bias in moving said ejector to said normal position against a stuck tip to further facilitate removal of said tip.

16. (Previously Presented) The mechanism as claimed in claim 14 including a mechanism for controlling the force with which the tip is mounted to said nozzle.

17. (Currently Amended) The mechanism as claimed in claim 14 wherein ~~there are~~ the nozzle is operable for receiving a plurality of different tip types, each of which contacts both the ejector and the nozzle as a respective tip is mounted to the nozzle and moves the respective tip against a bias force, each tip type having a different base configuration which results in a difference in relative displacement of the nozzle to the ejector, and further comprising a mechanism for detecting such difference in the relative displacement to thus identify a tip type.

18. (Currently Amended) A mechanism for facilitating the removal of a pipette tip from a pipette nozzle including a mechanism which stores mechanical energy when the tip is mounted to said nozzle, and which releases the stored mechanical energy when the tip is to be removed to facilitate removal thereof, said mechanism for storing includes a latching mechanism operative when said mechanical energy is fully stored; and operative for generating an operator detectable output ~~being generated when said latching mechanism operates.~~

19. (Previously Cancelled)

20. (Previously Presented) The mechanism as claimed in claim 18 including a mechanism which limits the force with which the tip is mounted to the nozzle.

21. (Previously Presented) The mechanism as claimed in claim 18 including an overforce mechanism for further facilitating removal of a stuck tip.

22. (Withdrawn) In a pipette, a mechanism for detecting a type of pipette tip from a plurality of tip types being mounted to a pipette nozzle including:

a sleeve mechanism surrounding said nozzle, at least one of said sleeve mechanism and said nozzle being mounted to be selectively retracted when in contact with a tip as the tip is pressed on said nozzle to be mounted thereto, each tip type having a different base configuration

which results in a difference in relative displacement of the nozzle to the sleeve mechanism, and a mechanism for detecting the difference in the relative displacement to thus identify a tip type.

23. (Withdrawn) The mechanism as claimed in claim 22 wherein said sleeve mechanism has a selected stroke, and wherein said mechanism for detecting includes a sensor generating an output when the sleeve mechanism is retracted for the selected stroke and a detector for nozzle retraction, said detector output, when said sensor generates the output, being indicative of tip type.

24. (New) In a pipette having a nozzle to which a tip may be removably mounted, a mechanism for facilitating the removal of the tip from the nozzle including:

a spring loaded ejector sleeve through which said nozzle passes, said sleeve terminating near an end of the nozzle to which a tip is mounted when the sleeve is in a normal position, the sleeve being moved away from said end of the nozzle against a spring load when the tip is mounted to said nozzle; and

said sleeve including a first latch portion which mates with a second latch portion of said pipette when said sleeve is in a retracted position to which said sleeve is moved when the tip is properly mounted to said nozzle to hold said sleeve in said retracted position against said spring load, and a third latch portion operable to unmate said first and second latch portions, freeing said sleeve to return in response to said spring load to the normal position, the sleeve engaging said tip before reaching said normal position to facilitate the removal of the tip, wherein

said first latch portion is a keyhole slot formed in said sleeve,

said second latch portion is a detent having a large portion which fits in an enlarged portion of said slot when said sleeve is in the retracted position and a small portion sized to fit in a narrow portion of said slot, said narrow portion being adjacent said detent except when the sleeve is in the retracted position, and

said third latch portion is a button operable for moving said small portion of the detent into said narrow portion of said slot, whereby said sleeve becomes unlatched.

25. (New) In a pipette having a nozzle to which a tip may be removably mounted, a mechanism for facilitating the removal of the tip from the nozzle including:

a spring loaded ejector sleeve through which said nozzle passes, said sleeve terminating near an end of the nozzle to which a tip is mounted when the sleeve is in a normal position, the sleeve being moved away from said end of the nozzle against a spring load when the tip is mounted to said nozzle; and

said sleeve including a first latch portion which mates with a second latch portion of said pipette when said sleeve is in a retracted position to which said sleeve is moved when the tip is properly mounted to said nozzle to hold said sleeve in said retracted position against said spring load, and a third latch portion operable to unmate said first and second latch portions, freeing said sleeve to return in response to said spring load to the normal position, the sleeve engaging said tip before reaching said normal position to facilitate the removal of the tip, wherein

said first latch portion is a keyhole slot formed in said sleeve, wherein

said second latch portion is a detent having a large portion which fits in an enlarged portion of said slot when said sleeve is in the retracted position and a small portion sized to fit in a narrow portion of said slot, said narrow portion being adjacent said detent except when the sleeve is in the retracted position,

said third latch portion is a button operable for moving said small portion of the detent into said narrow portion of said slot, whereby said sleeve becomes unlatched, and

said detent is spring biased to move the large portion of the detent into said enlarged portion of said slot.

26. (New) In a pipette having a nozzle to which a tip may be removably mounted, a mechanism for facilitating the removal of the tip from the nozzle including:

a spring loaded ejector sleeve through which said nozzle passes, said sleeve terminating near an end of the nozzle to which a tip is mounted when the sleeve is in a normal position, the sleeve being moved away from said end of the nozzle against a spring load when the tip is mounted to said nozzle; and

said sleeve including a first latch portion which mates with a second latch portion of said pipette when said sleeve is in a retracted position to which said sleeve is moved when the tip is

properly mounted to said nozzle to hold said sleeve in said retracted position against said spring load, and a third latch portion operable to unmate said first and second latch portions, freeing said sleeve to return in response to said spring load to the normal position, the sleeve engaging said tip before reaching said normal position to facilitate the removal of the tip, wherein said first latch portion is a keyhole slot formed in said sleeve, wherein

said first latch portion is a projection at a proximal end of said sleeve,

said second latch portion is a mating lip on a latch plate biased to have the lip engage the projection when the sleeve is in the retracted position, and

said third latch portion is a portion of said latch plate which is manually operable to move the plate against the bias to move said lip away from said projection, permitting said sleeve to return to the normal position.

27. (New) In a pipette having a nozzle to which a tip may be removably mounted, a mechanism for facilitating the removal of the tip from the nozzle including:

a spring loaded ejector sleeve through which said nozzle passes, said sleeve terminating near an end of the nozzle to which a tip is mounted when the sleeve is in a normal position, the sleeve being moved away from said end of the nozzle against a spring load when the tip is mounted to said nozzle; and

said sleeve including a first latch portion which mates with a second latch portion of said pipette when said sleeve is in a retracted position to which said sleeve is moved when the tip is properly mounted to said nozzle to hold said sleeve in said retracted position against said spring load, and a third latch portion operable to unmate said first and second latch portions, freeing said sleeve to return in response to said spring load to the normal position, the sleeve engaging said tip before reaching said normal position to facilitate the removal of the tip, wherein said first latch portion is a keyhole slot formed in said sleeve, wherein

said first latch portion is a projection at a proximal end of said sleeve,

said second latch portion is a mating lip on a latch plate biased to have the lip engage the projection when the sleeve is in the retracted position, and

said third latch portion is a portion of said latch plate which is manually operable to move the plate against the bias to move said lip away from said projection, permitting said sleeve to return to the normal position, and including

an angled surface on said plate positioned to engage an angled surface associated with said sleeve when said latch plate is moved beyond a point where said lip no longer engages said projection to supplement said spring load in moving said sleeve to the normal position against a stuck tip to further facilitate removal of said tip.

28. (New) A mechanism for facilitating the removal of a pipette tip, comprising:

a spring loaded nozzle, the nozzle being moved against a spring load when the pipette tip is mounted to the nozzle;

a spring loaded ejector sleeve through which the nozzle passes, the ejector sleeve terminating near an end of the nozzle to which the pipette tip is mounted when the ejector sleeve is in a normal position, the ejector sleeve being moved against a spring load when the pipette tip is mounted to the nozzle; and

the ejector sleeve including a first latch portion which mates with a second latch portion when the ejector sleeve is in a retracted position to which the ejector sleeve is moved when the pipette tip is properly mounted to the nozzle to hold the ejector sleeve in the retracted position against the spring load, and a third latch portion operable to unmate the first and second latch portions, freeing the ejector sleeve to return in response to the spring load to the normal position, the ejector sleeve engaging the pipette tip before reaching the normal position to facilitate the removal of the pipette tip.

29. (New) A mechanism for facilitating the removal of a pipette tip, comprising:

a spring loaded nozzle, the nozzle being moved against a spring load from a normal position to a retracted position and back to the normal position when the pipette tip is mounted to the nozzle;

a spring loaded ejector sleeve through which the nozzle passes, the ejector sleeve terminating near an end of the nozzle to which the pipette tip is mounted when the ejector sleeve

is in a normal position, the ejector sleeve being moved against a spring load when the pipette tip is mounted to the nozzle; and

the ejector sleeve including a first latch portion which mates with a second latch portion when the ejector sleeve is in a retracted position to which the ejector sleeve is moved when the pipette tip is properly mounted to the nozzle to hold the ejector sleeve in the retracted position against the spring load, and a third latch portion operable to unmate the first and second latch portions, freeing the ejector sleeve to return in response to the spring load to the normal position, the ejector sleeve engaging the pipette tip before reaching the normal position to facilitate the removal of the pipette tip.

30. (New) The mechanism as claimed in claim 29, wherein

the spring loaded nozzle is operable for creating a gap between the pipette tip and a distal end of the ejector sleeve when the sleeve is in the retracted position and the tip is mounted to the nozzle.

31. (New) A mechanism for facilitating the removal of a pipette tip, comprising:

a spring loaded nozzle to which the pipette tip may be removably mounted; and
a spring loaded ejector sleeve through which the nozzle passes.

32. (New) The mechanism as claimed in claim 31, wherein the ejector sleeve includes a first latch portion, and further comprising:

a second latch portion which mates with the first latch portion when the ejector sleeve is in a retracted position to which the ejector sleeve is moved when the pipette tip is properly mounted to the nozzle to hold the ejector sleeve in the retracted position against a spring load; and

a third latch portion operable to unmate the first latch portion and the second latch portion, freeing the ejector sleeve to return in response to the spring load to a normal position, the ejector sleeve engaging the pipette tip before reaching the normal position to facilitate the removal of the pipette tip.

33. (New) A mechanism for confirming a proper mounting of a pipette tip on a nozzle of a pipette, comprising:

a first latch portion of the pipette; and

a second latch portion of the pipette operable for mating with the first latch portion, the first latch portion and the second latch portion generating an operator perceptible feedback output when mating.

34. (New) The mechanism as set forth in claim 33, wherein

the operator perceptible feedback output is at least one of an audible output and a tactile output.